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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/021,743	12/12/2001	Michael Halle	ZOG-009	5619

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EXAMINER

ALLEN, DENISE S

ART UNIT	PAPER NUMBER
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2872

DATE MAILED: 08/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/021,743

Applicant(s)

HALLE ET AL. *HL*

Examiner

Denise S Allen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 16 June 2003 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Information Disclosure Statement

In light of the Applicant's statements regarding German patent DE 43 01 477 in the response filed on June 16, 2003 (paper #7), this document has been considered by the Examiner. This patent is listed on the attached Form PTO-892.

Drawings

The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on June 16, 2003 have been approved. A proper drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The correction to the drawings will not be held in abeyance.

In light of the Applicant's amendment to the specification on June 16, 2003 (paper #7), the objections to the drawings in the Office Action on March 13, 2003 (paper #6) have been withdrawn.

Response to Amendment

In light of the Applicant's amendment to the specification on June 16, 2003 (paper #7), the objections to the specification in the Office Action on March 13, 2003 (paper #6) have been withdrawn.

In light of the Applicant's amendment to claims 10 and 22 on June 16, 2003 (paper #7), the objection to claims 10, 11, 22, and 23 in the Office Action on March 13, 2003 (paper #6) has been withdrawn.

Response to Arguments

In the Applicant's response on June 16, 2003 (paper #7), the Applicant argues with respect to claims 1 - 23, that Morton fails to teach or reasonable suggest a lens array that reproduces visual information from the backplane to a finite conjugate region in free space as recited in claims 1 and 12 (pages 3 - 5). This argument has been fully considered and found to be persuasive. The Examiner agrees that the lens array of Morton does not produce a real image of the information located at the backplane.

The rejection of claims 1 - 5 and 7 - 11 under 35 U.S.C. 102(b) as being anticipated by Morton in the Office Action on March 13, 2003 (paper #6) has been withdrawn.

The rejection of claims 6 and 12 - 23 under 35 U.S.C. 103(a) as being unpatentable over Morton in the Office Action on March 13, 2003 (paper #6) has been withdrawn.

Claim Rejections - 35 USC § 102

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1 - 23 are rejected under 35 U.S.C. 102(e) as being anticipated by Allio (US 6,574,042).

Regarding claims 1 and 12, Allio teaches a lens array (Figure 1) comprising an array of lens elements (reference 10) having a backplane (located at "P" at left-hand side of Figure 1) for reproducing an image ("P") located at the backplane, each lens having a non-unitary magnification (compare "P" and I₁) and reproducing visual information from the backplane to a finite conjugate region (reference I) in free space such that the reproduced visual information

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overlaps with visual information reproduced in free space by at least one neighboring lens element (column 6 lines 12 – 20).

Regarding claims 2 and 14, Allio teaches the visual information is reproduced by the lens elements as a stereoscopic image (column 1 lines 59 – 63).

Regarding claims 3 and 15, Allio teaches a source of visual information on the backplane, the visual information comprising pixels each constituting a discrete component of visual information, each lens element producing an aerial image comprising multiple pixels simultaneously viewable at the conjugate region (column 6 lines 28 – 34).

Regarding claims 4 and 16, Allio teaches the visual information produced in free space varies with a viewing angle (column 2 line 30 – column 3 line 8), the lens elements having lens pitch (reference p) defining center-to-center distances there between and cooperating to reproduce an image having a spatial resolution (reference B) distinct from the lens pitch ($B \neq p$).

Regarding claims 5 and 17, Allio teaches the lens elements cooperate to reproduce an image having a spatial resolution greater than the lens pitch ($B > p$).

Regarding claims 6, 12, and 18, Allio teaches the lens elements have magnifications ranging from 1:8 to 1:100 (column 8 lines 18 – 19 and 60: $\gamma_2 = -0.025$ equates to a magnification of 1:40).

Regarding claims 7 and 19, Allio teaches the lens elements cooperate to project a finite conjugate field to a series (references I_1 , I_2 , I_3 , and I_4) of inherently curved quadratic surfaces in free space. As illustrated by Hecht, the conjugate field produced by a lens is inherently curved

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(Figure 6.25). This curvature is the Petzval field curvature, which is quadratic by definition (Equation 6.43).

Regarding claims 8 and 20, Allio teaches quadratic surfaces produced by each of the lens elements intersect, forming a mosaic virtual field having locally varying spatial and angular resolutions (column 2 line 52 – column 3 line 8).

Regarding claims 9 and 21, Allio teaches the lens elements have a residual field curvature (as described above as Petzval field curvature) so as to vary locally in magnification, the mosaic virtual field and varied magnification facilitating visual decorrelation of images individually produced by the lens elements (column 2 line 52 – column 3 line 8).

Regarding claims 10 and 22, Allio teaches the lens elements have a residual field curvature (as described above as Petzval field curvature) so as to vary locally in magnification, the lenses providing an angular resolution increasing toward a center of a viewing field (column 3 lines 1 – 3) and a spatial resolution increasing at peripheral angular locations (column 3 lines 4 – 7).

Regarding claims 11 and 23, Allio teaches a degree of visual-information overlap determines a rate at which spatial resolution decreases with distance from the center of the viewing field (column 2 line 66 – column 3 line 8).

Regarding claim 13, Allio inherently teaches the step of varying a distance between the visual information and the backplane to vary the magnification. As illustrated by Hecht, the magnification caused by a lens is inherently dependant on the distance of the visual information and the lens (Figure 5.26).

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Denise S Allen whose telephone number is (703) 305-7407. The examiner can normally be reached on Monday - Friday, 8:30am - 5:00pm.

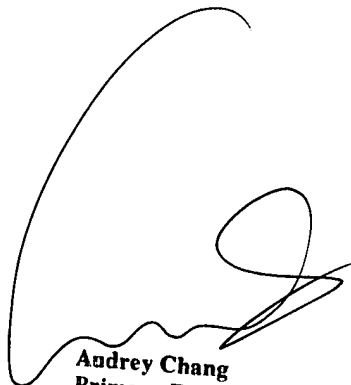
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew A Dunn can be reached on (703) 305-0024. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

Denise S Allen
Examiner
Art Unit 2872


dsa

August 11, 2003


Audrey Chang
Primary Examiner
Technology Center 2800